

Student Handbook – ADK Winter Mountaineering School

Student Handbook

Winter Mountaineering School

**Equipment & Preparation for Cold Weather Mountaineering
in New York and New England**

**Sponsored for over 60 years
by the Adirondack Mountain Club**



Welcome to Winter Mountaineering School!

This handbook contains information to be used in preparing for Winter School. It is organized as follows:

- I. General Information
- II. Training and Conditioning
- III. Equipment Discussion
- IV. Food Discussion
- V. Conclusions
- VI. Selected Reading/Resources
- Appendix A – Day Hike Checklist
- Appendix B – Weekend Backpack Checklist
- Appendix C – Combination (“Combo”) Checklist (Day hikes and backpack)
- Appendix D – Detailed list of changes from the previous version of this Handbook

Please study this handbook carefully, noting that the Equipment List contains certain items that are REQUIRED. This handbook has been prepared especially for Winter School, but is neither a comprehensive text nor a substitute for experience. Individual hiking group leaders may send out supplementary information to clarify the requirements for particular hiking/backpacking groups.

This handbook has evolved over the years to provide good information to Winter School participants. Your comments will help us to improve this handbook and are welcome. The best way to contact us is via email. For program issues send an email to

wmsadk+programinfo@gmail.com. For gear questions use wmsadk+techinfo@gmail.com.

The ADK Winter Mountaineering School website is www.winterschool.org.

With thanks to all the past and present staff who provided technical and literary suggestions.

Cover Photo: Winter Mountaineering School group departing Mt. Colden, February, 2013

I. GENERAL INFORMATION

Purpose:

The Adirondack Mountain Club has sponsored Winter Mountaineering School for over 60 years. Our purpose is to promote and teach safe winter mountaineering and camping techniques. The curriculum includes, but is not limited to, hydration and nutrition, winter ascent techniques, efficient gear use, route finding/navigation, and risk management. We attempt to spend the majority of the time in the woods learning, practicing, and applying these techniques. Activities in many of the groups will include non-technical ascents of major peaks. Upon completion of the program, each participant will have been exposed to a wide range of complementary skills that allow safe travel and recreating in the best and worst northeastern winter conditions.

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Feedback from previous programs indicates that participants react most favorably when techniques are presented as part of a “learn by doing” approach. Our curriculum is based upon this principle. The overall intent is to get the participants out in the mountains where they can observe and interact with our staff of friendly winter veterans.

Staff:

The Winter School Staff consists entirely of volunteers. Many started out by attending Winter School as students themselves. While our volunteers are from varied geographical locations and occupational backgrounds, each member comes to us with a solid base of winter mountaineering experience. Over the years we have become a great group of high quality mountaineers who are also excellent teachers. These men and women are a fantastic information resource prior to, during, and after the session. Take advantage!

Participants:

Participants must make every effort to be fully prepared for the program. Past experience shows that participants best equipped to learn are those who are in excellent aerobic condition. If you have any doubt about your ability to either run 5 miles or hike 10 miles over hilly terrain and feel good the following day, you need to improve your stamina. It is not realistic to believe that your participation in the school will “whip you into shape”. The demands made upon the body by the cold and necessarily strenuous activity are constant during the session. Poorly conditioned participants lose muscular reserves each day, and become prime candidates for serious injury. Participants who have difficulty keeping up with their assigned group will be shifted to a less strenuous group for the safety of the participants. Remember: the hiking party goes as fast as its slowest member.

Due to the nature of the program and the conditions under which it is run, all participants must be prepared for both physical and psychological challenges.

If, after reading this handbook, there is any question as to your suitability for the group you have selected (or have been placed into), PLEASE contact the program director (wmsadk+programinfo@gmail.com). Be honest with yourself and with us.

FOR YOUR COMFORT AND SAFETY, IF YOU ARRIVE AT WINTER SCHOOL IN POOR PHYSICAL CONDITION OR WITH INADEQUATE OR UNACCEPTABLE EQUIPMENT, THE ALTERNATIVES WILL BE TO EITHER PURCHASE/RENT EQUIPMENT (IF POSSIBLE) OR BE EXCLUDED FROM PARTICIPATION IN PORTIONS OF THE PROGRAM’S ACTIVITIES. IN THE PAST, PARTICIPANTS HAVE BEEN WALKED OUT OF THE WOODS AND SENT HOME IF SEVERELY UNDEREQUIPPED. YOUR SAFETY AND THE SAFETY OF THE GROUP IS TAKEN VERY SERIOUSLY BY OUR INSTRUCTORS.

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We don't wish to appear hard-nosed about this, but some people exhibit unbelievable “creativity” in assembling or not assembling their equipment. Your performance and enjoyment, and that of the group, hinges on everyone having their act together. Thanks in advance!

Changes to this version of the Student Handbook:

A short list of the changes in this version of the handbook are listed below. More details can be found in the Change History section near the end.

- Moved the checklists to the end
- Added and clarified information about the following topics
 - Physical requirements
 - Layers: Base, medium, heavy
 - Snowshoes
 - “Puffy” coat
 - 800, 850 and 900 fill power down
 - Traction devices or “Lightweight” crampons
 - Keeping sleeping bag dry (vapor barrier liners)



Whiteface Mountain

II. TRAINING AND CONDITIONING

Everybody who participates in Winter School wishes they were in better physical shape.

No matter how strong you are, the mountains are tougher. Winter hiking/backpacking is always going to be both physically and psychologically challenging. That is part of why it is so much fun!

Many participants arrive questioning whether they will be able to keep up. Prior experience has shown that those who conscientiously follow a training program and have ventured out on a cold weather hike to test their boots and equipment prior to the school are generally more fit and self-confident. This helps them maintain a positive attitude and increases their enjoyment.

The well-conditioned winter hiker/backpacker concentrates on the long-term development of both leg/back strength AND cardiovascular capacity. Since most participants sign up for Winter School a month or so before the session, there is not enough time available to begin, and see results from, a comprehensive fitness program. In the short run, the most beneficial gains can be realized by devoting available training time to cardiovascular improvement rather than to a crash strength-building program.

Suggested Activities to Improve Cardiovascular Output:

Hiking/Backpacking: the best way to train for a backpack is to go out and do it. Choose an area with some good hills/mountains. If you cannot get to the mountains – pack your pack and hit the stairs! Building muscle memory is key to a good platform for fitness.

Aerobic Fitness Classes: Be sure to attend a class that leaves you sweaty and tired at the end. Choosing a class that doesn't get your heart working is a waste of valuable time.

Running: Excellent aerobic exercise. Do some hills. Dig out your old set of "Heavy Hands" and run with them. Don't have "Heavy Hands" – then fill soda bottles with water and use those.

Cross Country Skiing/Snowshoeing: If snow conditions prior to the school permit, this is obviously an appropriate kind of exercise for what we will be doing. Try to include hill climbing and carry a little (or a lot) of weight in a daypack.

Bicycling: Also good aerobic exercise, and easier on the knees than running. You can improve the quality of your workout by choosing a hilly course and by getting up off the saddle for the uphill. If you stand up on the pedals to climb hills, you will more effectively stress the quadriceps muscles. Standing is also more aerobically intense than climbing in the saddle.

Stair Machines: Another excellent way to humble yourself, as well as get a fine workout for mountaineering. If the machine is so equipped, choose a level of exercise so that you can stay on for about a ½ an hour.

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The absolute number of miles, hills, repetitions, minutes, etc. should vary according to the terrain and the individual. The key is that for you to set your training level so you feel you have really accomplished something.

It is unrealistic to expect that all staff and participants have the time to follow a daily exercise regimen. Improvement will be evident with a logical program that gets your heart rate elevated 3 or 4 times per week for $\frac{1}{2}$ or $\frac{3}{4}$ of an hour. Remember, however, that less intense, more infrequent or shorter duration training sessions produce only marginal increases in athletic performance.

It is always wise to speak with an experienced professional or doctor before beginning any exercise program. This is particularly true if you have any outstanding medical conditions.

Physical expectations will vary with the hiking/backpacking group you have chosen. Our goal is to provide each participant with a physically challenging program of climbing and backpacking. To accomplish this, the staff may find it necessary to divide up activities to accommodate individuals with different fitness levels. Due to the small group sizes however, many times that will not be possible and sometimes the pace will seem difficult for participants who are not in shape.

The key point is to **START SOME KIND OF TRAINING PROGRAM NOW!** Five days of hard running the week before the Winter Mountaineering School will do essentially nothing for your overall fitness, and it may cause injury. But a steady and thoughtful exercise program over the period of a couple of months can have substantial benefits.

Put down this handbook and go for a run or a ride, preferably outside!

III. EQUIPMENT

This section contains some thoughts and reasons for the Winter Mountaineering School's equipment requirements. Winter mountaineering places severe demands on equipment, and certain basics are viewed as critical for safe travel in the northeastern woods. Checklists for the various Winter Mountaineering School sections can be found in the appendices.

A few general points are in order:

- 1) Be sure to review the equipment discussion and associated checklist for your section carefully. Part of the check in process involves a requirement to unload your pack, spread out your gear, and have it carefully inspected by a team of our instructors. If you arrive with insufficient gear, you will need to attempt to purchase or rent it on short notice, or possibly not be able to participate in the section for which you signed up.
- 2) If you have any gear questions, send us an email at wmsadk+techinfo@gmail.com.
- 3) Cotton clothing is a huge NO! There is virtually no place whatsoever at Winter Mountaineering School for anything made with cotton. Cotton has an unacceptably long drying time for our purposes. Synthetic materials such as polypropylene, nylon, etc. dry much more quickly, thus saving precious body heat. Your wardrobe for Winter Mountaineering School should exhibit a total absence of cotton (Loj meals and evening workshops not included). No exceptions.
- 4) You will be amazed at the number of similar items such as fuel bottles, stoves, crampons and the like which you will see. We suggest marking all of your equipment for easy identification.
- 5) Zippers and cold weather do not always get along well. You would be wise to spray all zippers with a light coating of silicone prior to camp. This will help prevent them from icing up. Also, take the time to put a zipper pull loop or tag on each one so you can grab it while wearing mittens.

CARRYING YOUR GEAR ON THE TRAIL

Pack:

Winter mountaineering demands greater strength and volume than available from many summer backpacks. High capacity internal or external frame packs have proven themselves in winter mountaineering situations. For daypacks, the absolute minimum size is 2,500 cubic inches, and you must have a way to strap on snowshoes and other gear. The bare minimum capacity for an overnight winter pack is around 5,500 cubic inches, and many instructors use packs of 7,000 cubic inches or larger. Most participants wish they had more capacity when they start putting all their gear into the pack. For multiple night backpacks you should expect your pack to weigh between 50 and 70 pounds depending upon trip duration, your size and goals of the group. A pack weighing more than 80 pounds is a sign of poor preparation, extreme caution or reliance on old equipment that works fine but weighs a lot. Day hiking groups will usually be able to carry packs weighing less than 30 pounds. You need to have a pack large enough to carry your excess clothing if you get warm and to carry your share of group gear.

Please fit your pack carefully and try it out with all your winter gear prior to the beginning of Winter School. As you would do in the summer, make sure the pack is balanced well. Snowshoeing with a heavy pack is challenging enough as it is. If you don't have a large enough pack, one alternative to purchasing a larger one is to put the excess in add-on pouches or stuff sacks that can be strapped on if your existing pack/pack frame permits it.

Many packs are measured in liters instead of cubic inches. To help you determine pack size, the table below shows the approximate number of liters for selected numbers of cubic inches.

Cubic inches	Liter s	Cubic inches	Liter s	Cubic inches	Liter s	Cubic inches	Liter s
1000	16	3000	49	5000	82	7000	115
1500	25	3500	57	5500	90	7500	123
2000	33	4000	66	6000	98	8000	131
2500	41	4500	74	6500	107	8500	139

Pack Rain Cover:

This is required to keep your gear dry. We HIGHLY suggest you line each stuff sack with a plastic trash bag as well. A little extra insurance on keeping the sleeping bag or other items dry is always nice to have. Make sure your rain cover will fit over the pack with all the extra items you will have to strap on to the outside. Many will not and you may need to have a custom rain cover made for you. It has rained during Winter Mountaineering School before and usually the temperature drops again after that warm spell. Almost anything that has gotten wet will freeze. That is something you want to avoid happening.

Lashing Straps or bungee cords:

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These are used to attach gear to the outside of your pack. Extra straps or bungee cords are also needed to attach snowshoes, ice axes and perhaps crampons to your pack. Things that have to come off the pack periodically during the day like snowshoes are best held by bungee cords, which are easy to work with, especially with mittens on. Using straps require a little more delicate handling, but they are fine for items such as sleeping bags and tents. Except for an emergency tents and sleeping bags won't be used during the day and straps hold more firmly to the pack/frame and are less likely to have a bounce.

CAUTION:

It is often the case in winter that one hikes through dense, snow laden trees. In this situation it is possible that bungee cords can become detached from the pack and, at best, something falls off your pack. At worst the bungee cord “whips around” and causes an injury to you or someone else. For this reason some instructors prefer straps.



CLOTHING YOU WILL TYPICALLY WEAR WHILE HIKING

Boots:

Our requirements for boots are strict and non-negotiable. In the mountains of New York and New England we may very well have to contend with rain and slushy snow, followed by rapid and drastic drops in temperature. We get many, many questions every year regarding the suitability of various boots for our program. In order to address these we've come up with the following general guidelines - The **Winter Mountaineering School Commandments of Footgear**. Please read carefully and fully.

1. No boot, no matter what the manufacturer's claims, is waterproof when it comes to the varying conditions in the Adirondacks and New England. Frozen boots = frozen feet. Therefore for overnight backpacking sections, removable boot liners are mandatory, no exceptions. Removable liners allow boots to be field dried at best and kept from freezing solid at worst. Also, do not confuse a removable midsole for a removable liner.
2. Use of Vapor Barrier Liners (VBL) (see below for details) in combination with your sock system are strongly recommended for all sections and are required for overnight backpacking sections. Good quality vapor barrier liner socks can be difficult to find. In a

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pinch, a pair of bread loaf bags (2-per foot, per day) will work. Many of us with years of experience have come to realize that even the best of VBLs eventually delaminate and leak, so many of us use both the VBL and the bread bags, or two bread bags together. Vapor barrier liners are worn between your inner and outer socks and reduce the possibility of moisture from reaching the outer insulation sock as well as the boot insulation. They work - trust us.

3. There has been a great proliferation in "high tech" winter footgear. In general they are one-piece construction and lack removable liners. This type of boot is now considered acceptable for our weekend day hiking section ONLY since they can be kept warm overnight and dried while staying at the Loj. In general these should have full lacing, heavy lug type soles, full rubber water proof lowers and may have synthetic or heavily factory water proofed leather uppers. They must also work with your crampons, gators, and snowshoes. When in doubt ask.
4. GI issue mouse boots, i.e. the big white ones that make you look like Mickey Mouse, are still acceptable for our purposes for overnight trips. They are tricky to get to work with most crampons, snow shoes and gators however so try them out first. Many miles were logged with them in the early years of winter school. Or you can use...
5. Pac boots. But they must satisfy the first commandment above and have removable liners. They should have full lacing or an appropriately adjustable closure system, heavy rubber lowers with a lug sole and synthetic or heavily factory waterproofed leather uppers. But most instructors now use....
6. Plastic Mountaineering Boots. These are the most appropriate footgear for our school. They have some drawbacks, not least of which is their cost but overall they work the best for our overnight backpacking sections. Be sure to check the fit of crampons, snowshoes, and gators with the boots before arriving at school. Plastic mountaineering boots can be rented at some gear shops. Call in advance and reserve.
7. There are, in addition to the boots mentioned here so far, some very sophisticated, very expensive, single leather mountaineering boots available on the market these days. These boots are made for fast, alpine style ascents up mixed routes and are really made for conditions and terrain we do not have much of in the Northeast. Most importantly these boots do not satisfy the first commandment above and so, despite their expensive pedigrees, are not acceptable for our overnight backpacking sections.

The bottom line is that you need to have one pair of boots that are comfortable to walk in and perform well with snowshoes and crampons. It comes down to personal preference and where you want to make tradeoffs – comfort in walking a lot in them (plastic), or boots with less support for snowshoeing and cramponing (pac-boots). Note that without rigid boots it is not a matter of not being able to climb moderate slopes with crampons, but using different technique to avoid popping out of the ice.

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Any pac or mouse boot user needs to have a rubber patch kit to repair puncture holes. Puncture holes happen from a misplaced ice axe spike when walking, or forgetting that when wearing crampons you can't put one foot on top of another unconsciously as you are used to doing without causing serious damage to the boot and sometimes to the foot inside. Everything in the winter has to be done consciously.

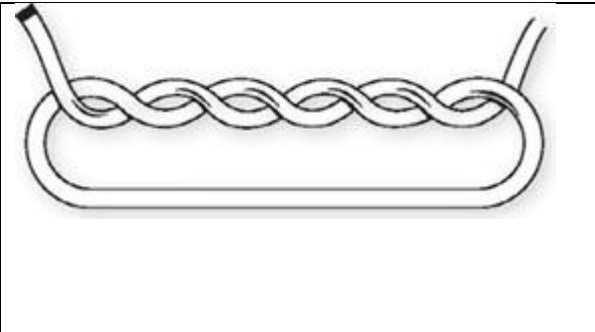
It is imperative that your feet be happy living in your boots for the duration of the program. Wear any new boots around home or work for several days to be sure. Don't overlook the tops of the boots chafing your shins. If you are using plastic boots and they don't fit well, take them to a good downhill ski shop. Many of the same techniques used on plastic ski boots can be applied to modify your mountaineering boots.

We realize that purchasing new boots for Winter Mountaineering School can be a serious impediment for many people who would like to attend the program, but we cannot compromise your safety with inadequate boots. Please contact us at wmsadk+techinfo@gmail.com if you have any questions on boots.

Notes on plastic boots:

Some people have experienced the tops of plastic boots chafing and/or bruising their shins. Before returning the boots or taking them to a ski shop for any modifications, try one or both of the following. For both the inner and the outer boot instead of lacing the boots all the way to the top, stop one or two eyelets down. The idea is to give more room at the top of the boot in the shin area.

Alternatively, try unlacing the inner boot part way down, say 2-3 eyelets. Add a "triple overhand knot" (see image to the right), snug up the laces for the bottom of the boot, tighten and hold in place using the triple overhand knot and then continue lacing to the top. For the top, snug up, but do not tighten, then tie the laces as normal. Your goal is to have the bottom of the boot laced snugly but the top loose.



Insulating Socks:

Experienced hikers almost always use two pair of socks - one thin pair of liner socks and one thick pair of insulating socks. Some use three pair of socks: a thin liner, a slightly thicker middle sock and a thick insulating sock. In a three layer sock system, some staff members use neoprene socks as the middle layer. See note on neoprene socks in the section on Vapor Barrier Liner socks.

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Wool or synthetic blend socks are suggested, with the edge towards synthetic blends since they dry more quickly. **BRING A MINIMUM OF 2 PAIRS OF INSULATING SOCKS**, since they may get wet from perspiration and vapor barrier liner seepage.

Don't forget that putting too many socks into boots will cause your feet to be cold because of restricted circulation. Make sure the fit of the boot is not too tight.

COTTON SOCKS OR COTTON/SYNTHETIC BLEND SOCKS ARE NOT ALLOWED

Vapor Barrier Liner (VBL) Socks:

VBL socks are critical to keep your insulating socks and boot liners dry. They are required for backpacking sections and are optional, but highly recommended on daytrips. The VBL sock is worn over a thin synthetic or silk liner sock and under the insulating sock. The liner sock gets wet from your perspiration, and at the end of the day you will need to remove your liner sock and get your foot into a dry sock to avoid trench foot. The liner sock will need either to be dried or replaced with a fresh one for the next day.

There are several options for VBL socks. The first is to purchase them. If you go this route they **MUST** be factory seam-sealed or seam-sealed by you prior to Winter School. If they are not seam-sealed they will leak and defeat the purpose. At least one manufacturer makes factory seam-sealed VBL socks. They are more expensive but will save you the aggravation of seam-sealing all the corners on VBL socks.

Although factory-made VBL socks work for some, others have had difficulty maintaining waterproof seams or find that they delaminate after a few uses, rendering the VBL socks useless. Another solution is to use heavy-duty plastic bags. You need to use two bags for each foot (one bag used alone will break) and bring extra bags for each day. Many find this method to work the best, with the insulating sock and boot liner remaining bone-dry even after several days of use. You can find suitable bags online (e.g., [5 x 4 x 24 inch bags \(Item number UF10G054024\)](#) from [foodservicedirect.com](#)).

Note that waterproof breathable socks or neoprene booties **ARE NOT** acceptable since water vapor will pass through and get your insulating layers wet, defeating the purpose of VBL socks.

The sock situation is best summarized as follows: a thin liner sock, covered by a VBL, followed by a thick insulating sock.

Notes on socks and VBLs:

Some have experienced that their socks and/or plastic bags used as VBLs tend to slip down the legs and foot and bunch up either in the toe area or under the foot. There are several ways to help reduce or, in some cases, eliminate this problem. The simplest is to use rubber bands. However, due to their narrow width they tend to become uncomfortable over time. A second option is to use a sock garter. A sock garter is a wide adjustable elastic band with one or two clips that attach to the sock and/or vapor barrier liner. The width and ability to adjust the tension of the elastic

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band help reduce the discomfort. Ideally the rubber bands or the elastic band of the sock garter are positioned above the calf muscle to help reduce the downward travel of the socks.

CAUTION: Do not use rubber bands that are so tight that they reduce circulation to the feet. Similarly do not tighten the elastic on the sock garter such that it also reduces circulation to the feet.

Notes on drying socks and boot liners:

While staying in the ADK Adirondack Loj there is a small drying room adjacent to the room with the fireplace where it is often possible to dry your socks and boot liners. Provided there is space in the drying room, a good plan is to dry out wet socks and boot liners overnight at the Loj. Another option is to use your second set of socks and boot liners while hiking on the second day and dry the first set at the Loj. As there is very limited space in the drying room, you can only dry so much stuff at night.

Drying socks and boot liners when backpacking is at best problematic and at worst nearly impossible. While the concept of drying your socks and boot liners in your sleeping bag sounds good in theory, in practice there are several issues. Here are a few. First, the moisture that is in your socks needs to go somewhere. As water vapor travels from the warm interior of the sleeping bag toward the below freezing exterior of the bag it condenses and freezes. This reduces the effectiveness of the insulation. Second, it takes heat to dry items and only source of heat is your body. Drying items has a cooling effect, do you really want your feet to be cooler? And third, when using a vapor barrier liner (VBL) in your sleeping bag (see section on sleeping bags), if you place your socks or boot liners inside the VBL they will become as moist as the inside of the VBL.

When backpacking some staff carry several pair of the liner socks and only one set of the heavy insulating layer socks. They use the VBL sock as outlined earlier and change the inner sock every day.

Bottom line: 1) Keep your socks and boot liners dry by using Vapor Barrier Liners (VBLs). 2) Have extra socks and boot liners. 3) Take advantage of any opportunity to dry gear.

Gaiters:

Tall gaiters that come up to just below the knee are required. They add warmth to your feet and keep snow out of your boots. Also, because properly fitting gaiters should be snug on the leg and boot, they also help reduce the likelihood of tripping by a crampon point catching in a pant leg. While it is important the gaiters be snug, they must also fit easily over your boots. They must be easy to get on and off even when iced up. They will be worn most of the time.

“Supergaiters” are acceptable (for plastic boots) if attached firmly to your boot. We strongly suggest using a fresh application of an adhesive to attach the rubber rand to your boot shell. If you would like extra warm feet, look for insulated supergaiters.

General information about clothing:

The secret to keeping warm in winter is by creating “dead air space” to trap the heat generated by your body. Conversely, the secret to keeping cool is dissipating the heat (and moisture) generated

by your body. The way to achieve this is having a versatile system of layers that adds thickness (dead air space) when you need to hold in body heat and reduces thickness when you need to be cool and dissipate moisture.

The discussion below addresses insulation for both the upper and lower body.

- Base layer – that which is next to your skin
- Insulating layers – those which go over the base layer and inside any wind or rain shell

READ THIS – Notes on Insulation

Applies to parkas, “puffy coats” and sleeping bags

Although the text states “down” insulation, the words apply to both down and synthetics

In addition to the usual down vests and parkas, recent years have seen a vast increase in new types of down clothing: sweaters and shirts for example. In addition, the “fill power” of the down used in garments has also increased. 800, 900 and even over 1000 fill power down is available from some manufacturers. Fill power is the volume in cubic inches displaced by one ounce of down. As noted above in the general information section, it is dead air space that traps the heat and the larger volume of dead air space created by one ounce of down means that for a given thickness of insulation the overall weight of a garment should be lower. However, while keeping weight low is important, in general what really matters to keep warm is the thickness of a garment, not the fill power of the down.

As stated above, what matters for your parka, “puffy coat” or sleeping bag is the thickness created by the down. For the purposes of Winter Mountaineering School, one inch of dead air space created with 900 fill power down is the same one inch of dead air space created by a wool sweater. Yes, there are some differences, but for the purposes of WMS they do not matter. The down article will, however, probably weigh significantly less.

During the gear check on the first day, the Winter Mountaineering School staff will be looking for parkas and “puffy coats” that create inches of insulation. You will need considerable insulation to stay warm when not moving. Just because your garment is filled with 900 fill power down does not necessarily make it acceptable. Thick is good, thin is not.

A thick “puffy jacket” with hood is required. The staff will look at this item during the gear check on the first day.

When in doubt contact us at wmsadk+techinfo@gmail.com we will be happy to help you avoid bringing or purchasing expensive down articles that are not appropriate for Winter Mountaineering School.

Insulating Layers:

Managing changes in temperature are common in winter. As it gets colder, or the group enters an above tree line zone, or the group stops to make camp, or any other “cold” reason, additional insulation layers should be added quickly to maintain comfort. The additional insulating layers

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are worn over the base wicking layer. A system of layered garments offers the most flexibility for adjusting to changing activity or temperature. Here are some examples:

- A light or medium thickness synthetic or wool layer. (A zip neck should be considered for this layer as it provides improved temperature regulation.)
- A medium thickness synthetic jacket
- A thick synthetic jacket
- A down or synthetic parka with hood

Head and hand insulation and protection are addressed separately.

Base Layer (Wicking Long Underwear):

Two sets (top and bottom) of long-sleeved, medium-weight synthetic or Merino wool base layer underwear is required. The fit should be snug and contoured to your body in order to reduce bulk and allow for a full range of motion. It is both light in weight, and more importantly, quick drying. **LONG UNDERWEAR WITH ANY COTTON IS NOT ACCEPTABLE.**

Please note that 100% merino wool underwear has a longer drying time than synthetic.

A second set is for emergency use during day hiking, and if you prefer more frequent changes of clothing or a thicker set for evening wear. Some people who faithfully use a sleeping bag VBL prefer to switch into their dry backup synthetics if their primary set is still damp from the day's activities before getting into the VBL.

Most staff members will “live” in their base layer for the duration of the program. For hiking, they will put on breathable wind pants and jacket over the base layer.

Rain Gear:

The winter weather in New England and the Adirondacks is among the most challenging to be found anywhere. It may rain, it may sleet, it may blow or it may snow. Temperature changes of 50°F in an 8-hour period have been recorded in the past. During the 1989-90 School it went from -26°F to +42°F rain in 36 hours. The School of 2007/08 was a slushy, muddy hypothermia-dodging session. We must be prepared for EVERYTHING. Wind/rain gear consisting of pants and a jacket are required. Ponchos are not allowable since they do not cover well. Rainwear made with PVC plastic or rubberized fabric either rips too easily or is too heavy for our purposes.

Most participants and staff will show up with a waterproof/breathable laminate type jacket and pants/bibs of the same material. Waterproof/breathable laminated fabrics are at best a compromise. They are waterproof and offer some breathability, although no waterproof/breathable laminate jacket breathes as well as an uncoated nylon shell. Nor will they keep you as dry as a rubberized raincoat. Expect to be somewhat moist from either perspiration or from rain seepage. It is the “quick drying” characteristic of the synthetic underwear that allows us to deal with the shortcomings of these fabrics.

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If you have noticed that your waterproof/breathable laminated clothing does not repel water as well as it is used to, wash-in treatments are available that may restore the repellency somewhat.

Overpants that have a full zipper up the legs are decidedly better than those without, since you can put them on and remove them without taking off your snowshoes or crampons. Better jackets have drawstrings at the waist and hood, and ventilation zippers under the armpits. As you will soon learn, more pockets are better than fewer. Your jacket and pants must be large enough to fit easily over a fleece jacket and pants (or equivalent) without constriction.

Caution: When in the mountains (and far away from any gear shops) many participants discover that their wind/rain jacket and pants do not fit over their insulated clothing. Check before you remove the tags from newly purchased gear.

The combination of an uncoated nylon wind suit and a separate coated nylon rain suit is also acceptable. It is much more time consuming and difficult to use this method effectively, but you will notice that some staff have decided the extra weight and hassle more than offset by being able to stay cooler when hiking. You have to work a lot harder to keep snow off your clothing to avoid getting it wet, but being overheated while you walk will get you wet as well.

Hat:

Warm headgear is an absolute necessity. Fleece or wool is the best. You can lose up to 30%+ of your body heat through the head and neck. Some people find wool itchy, so try it at home since you will wear it most of the day and, when backpacking, sleep in it at night. Other hat designs are acceptable as long as they are very warm (thick), completely cover your ears and will remain firmly on your head while you sleep. There are many hats available today that do not sufficiently cover the ears. These are not acceptable.

Protection for your hands – Mittens, Mitten Shells and Liner Gloves:

An effective system for the hands consists of lightweight synthetic liner gloves, heavier synthetic or wool mittens and a nylon mitten shell (preferably with a coated nylon palm and a waterproof/breathable laminate back). Depending on the temperature and the level of activity, you can choose the most comfortable combination. Thin glove liners, also known as anti-contact gloves, are very important. Expect to wear a pair for pretty much the entire time. They serve to separate your hand from the cold nylon shell, the ice axe, and are indispensable around camp for working with cold metal stove parts and pots. TWO PAIR are required, since they tend to rip/melt easily.

Mittens are the next step in hand protection for when it is really cold or you are inactive. They can be made of pile (synthetic) or wool. There are pros and cons to each type.

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Pile: <ul style="list-style-type: none">• Tends to be lighter than wool• Does not hold moisture, therefore dries quickly• May not be as effective at blocking wind• Some brands have wind blocking• Collects snow	Wool: <ul style="list-style-type: none">• Those with dense knit tend to be effective at blocking wind• May weigh more than pile• Due to the rough surface may tend to collect snow• Take longer to dry than pile• Can often be found in “double thick” versions which are very warm
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It is strongly recommended that you have a extra pair of mittens. However, if you are bringing wool mitts, TWO PAIR are required.

The nylon gauntlet-style mitten shell is the outermost layer. This is necessary to prevent wind penetration and snow build-up over the insulating layers.

The best mittens or mitten shells do you no good if they blow away in high winds. Idiot cords, dummy cords, security cords and glove/mitten leashes are some of the names used to describe techniques that attempt to keep you and your mittens or shells together. There are pros and cons to each approach and each person needs to work out their own system.

ITEMS NEEDED FOR TRAVEL OVER SNOW AND ICE

Snowshoes:

A wide variety of snowshoe shapes have evolved to meet a similar variety of snow conditions and terrain. Unfortunately, many of these designs are inappropriate for northeastern winter mountaineering. We will need snowshoes designed to excel in the backcountry while traveling on steep trails with variable snow and ice conditions. They must be good for climbing high-angle slopes, and for bushwhacking in dense forest growth.

In general, snowshoes designed for backcountry/alpine use for ascending steep terrain are best. We have found that lightweight metal snowshoes with built-in crampons have proven themselves to have a reasonable combination of the desired characteristics for the northeastern woods. If possible, get the most aggressive of the crampon options available. Long points are best to give traction climbing up steep slopes with heavy packs and in slushy conditions where the snow builds up under the snowshoe. We will be wearing snowshoes most of the time and not worrying about slipping with a heavy pack on is important.

Be forewarned that no one size of snowshoe provides full flotation under all circumstances. While various sources suggest sizes of specific models for a given total load, it is a mistake to assume that a larger snowshoe will out-perform a smaller snowshoe of a given type. Most people find that metal-frame snowshoes about 24 to 32 inches long work well for most

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conditions in New York and New England even if the sum of your weight plus that of the pack exceeds the weight recommendations of the manufacturer. In general, most people hike with a group. As such the first two people on the trail will pack down the snow sufficiently to give the others in the hiking party a semi-packed surface. This is the main reason snowshoes 24-32 inches work for most people. A second reason is that in New York and New England our snow tends to be denser than the powder often found in the west. Denser snow tends not to compress as much, therefore the 24-32 inch shoe is usually sufficient.

If you don't already own snowshoes, it may be better to try and rent some and just observe what other people are using and the pros and cons of various brands and models. After the School you can then make your purchase with a little better background.

It is **CRITICAL** to fit your boots to the snowshoes prior to attending Winter School. If you are renting them somewhere, make sure you take your winter boots with you for a fitting. Remember, your heavy winter boot must fit **THROUGH** the toe hole without catching on the webbing.

Wooden snowshoes:

For many years bearpaw, modified bearpaw, and beavertail style snowshoes were used at Winter Mountaineering School to scale many peaks. However, metal framed snowshoes, as described above, are the current standard and we have not seen wooden snowshoes at WMS for many years. Those who plan to use wooden shoes should be sure that they have a binding such as a "Howe", which has a toe piece that folds over the front of your boot to prevent the boot from slipping forward on steep descents. You will also need to fit these snowshoes with crampons, and be sure that all leather bindings are fully waterproofed. If your snowshoes are laced with rawhide webbing, varnish them well before attending Winter School. The same goes for the wooden frames. If you use wooden snowshoes be aware that the track made by metal framed snowshoes is significantly narrower than those created by the typical wooden snowshoe. This means that the person wearing wide snowshoes will be breaking a wider trail than those with narrow shoes and/or the outer edge of the shoe will be higher than the inner edge causing considerable stress on your ankles. While wooden snowshoes still work however, we feel that it is money well spent to rent or borrow a pair of metal framed snowshoes for your Winter School experience.

Crampons:

Full crampons, (along with point protectors or a heavy gauge crampon bag) are an integral part of a complete winter mountaineering system and are required. Without crampons you will simply not be able to go on most trips since under many conditions the group will not be able to summit unless everyone in the party has crampons. Also crampons are required for the ice axe and crampon workshop typically held the first day of Winter Mountaineering School.

The best crampon selections for our purposes are hinged 12-point crampons. All crampons must be equipped with straps or a clip-on attachment system that fits your boots.



Photo: Mastering the plunge step

Before coming to Winter School

CHECK THE FIT OF YOUR CRAMPONS ON YOUR BOOTS AND

MAKE SURE THE CRAMPONS STAY ON YOUR BOOTS WHILE HIKING

On the first day of Winter School the staff performs a detailed equipment check. During this equipment check you will be asked to demonstrate that your crampons do indeed fit your boots AND stay on the boots when hiking. Even the most patient staff member will balk at having to help fit crampons at -20°F.

Note: Aluminum crampons are not acceptable for Winter Mountaineering School as they do not adequately penetrate the hard water ice often found in New York and New England.

Crampon Bag/Point Protectors:

Please make sure you have your crampons in their bag or with point protectors on. For safety reasons, you are required to have the points covered at all times the crampons are not being used. Sometimes people forget how dangerous they are and just bungee cord them on to the back of

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the pack with the points all facing the face of the person hiking behind them. We wish to avoid that.

Traction Devices:

There are a wide variety of traction devices, also called mini-crampons, in-step crampons, creepers, etc., available today. While not a substitute for full (10 or 12 point) boot crampons, they can be very useful as a traction aid on relatively flat trails or in the parking lot. You can even use them at home when walkways and driveways are icy. We strongly encourage having mini-crampons. Many brands are available.

Crampon maintenance:

Inability of crampon points to penetrate ice or hard snow or breakage of a crampon can put the user in precarious situation. We strongly encourage you to perform a detailed examination of your crampons after every use, check any bolts for tightness, examine for areas where the metal may have bent and assess if the points need to be sharpened. A good time to perform this examination is when you are drying the crampons after a trip. Perform any maintenance, including sharpening, and if necessary, replace the crampons.

Sharpening crampons is done by hand with an appropriate file. Consult the information provided by the manufacturer for specifics on how to sharpen your crampons.

Mountaineering Axe (Ice Axe):

An ice axe is required as it is an essential tool for the winter mountaineer. Although some will argue that an ice axe is not a strict necessity for most peaks in New York and New England, in many situations it is the best tool for the job. As a Winter Mountaineering School, we strive to teach skills that will take our students beyond the New York and New England if they so desire. We almost always include workshops and practice for proper crampon and ice axe technique in our programs. How much we actually use them on ascents in any given year depend on snow and ice conditions, but you will leave the program with knowledge of, and experience with, basic ice axe and crampon technique.

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The sizing of the ice axe is a matter of taste and how you will use the axe. Ice climbers prefer short axes (less than 65 cm). Winter hikers and general mountaineers often prefer an axe that reaches the ground when held at your side (70-85 cm). As you may suspect, there is some controversy about this topic. If you prefer to use your axe as a stabilizer while you snowshoe, a longer axe is preferable. If you plan to hike with ski poles or without any other support, then bring a smaller and lighter axe.



Ice Axe Protectors (Pick, Adz, Spike):

For safety reasons it is required that your ice axe be covered with spike and head protectors when you have it strapped to your pack.

Ice Axe Leashes:

Ice axe leashes, also known as wrist loops, can be another controversial subject. The leash can attach the axe to either your wrist or, if you are wearing one, a climbing harness. Based on the terrain typically traveled while at Winter Mountaineering School ice axe leashes are not needed, therefore will not be used. For an excellent discussion of ice axe leashes see Mountaineering: The Freedom of the Hills (The Mountaineers Books, Seattle, WA).

**ITEMS NEEDED TO BE READILY ACCESSIBLE
OR ON YOUR PERSON WHILE HIKING**

Paper and Pencil:

These are important emergency items. Pens are useless since the ink refuses to flow at cold temperatures. Note that paper should be carried in a zip-lock plastic bag. Some people find that index cards are better than paper as they are a bit more rigid and easier to write on.

Maps and Guidebooks:

A good map and guidebook is critical for safety and enjoyment. The following table lists areas in New York and New England and selected sources.

Area	Source of guidebooks and maps	Web address
Adirondacks – New York	Adirondack Mountain Club	www.adk.org
Catskills – New York	Adirondack Mountain Club	www.adk.org
Green Mountains – Vermont	Green Mountain Club	www.greenmountainclub.org
White Mountains – New Hampshire	Appalachian Mountain Club	www.outdoors.org
Randolph Valley and Northern Peaks Trail Map – White Mountains – New Hampshire	Randolph Mountain Club	www.randolphmountainclub.org
Maine	Appalachian Mountain Club	www.outdoors.org

For off-trail travel, USGS 1:24,000 scale maps are preferable. These can be purchased in paper form from many outdoor stores. Quad maps can be downloaded for free from the USGS digital store in portable document format (pdf).

Put all paper maps in a zip-lock plastic bag if you want them to last past the first day.

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Compass:

Liquid filled, flat, base plate or protractor type compasses are appropriate for hiking. The liquid filling dampens the movement of the compass needle making it easier to use and the clear plastic base allows you to see features on the map. In general there are two types of base plate compasses: non-declining and adjustable-declination.

With a non-declining compass the user must compensate for the difference between magnetic and true north. With an adjustable-declination compass the user sets the appropriate declination in the compass and then the compass is ready to use. No worry about adding or subtracting to determine true north.

Winter Mountaineering School now requires that you bring a compass that is auto-declining; *unless* you are proficient with the non-declining type.



White out conditions (or the potential for white out due to blowing snow) make having a compass and knowing how to use it an important winter navigation skill.

Plastic Whistle:

This is helpful for signaling and locating a lost person or being found if you are that lost person, and for communicating on the trail. Wear it around your neck.

CLOTHING THAT NEEDS TO BE IN YOUR PACK – “EXTRA CLOTHING”

Please refer to the general notes on clothing earlier in this handbook. Specifically the information on down and down fill power.

Insulated Jacket/Sweater for Warmth:

A fleece, wool or synthetic jacket/sweater is required for times when more insulation is needed while on the trail. This layer of clothing should be of moderate thickness, reasonable warmth and should be simple to put on and take off. Some individuals like to take along an extra fleece

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top for very cold conditions. If using two fleece tops, they should be roomy enough to be used in combination.

Insulated Pants for Warmth:

Warm, insulated pants of some sort are required for wear around camp, and perhaps above treeline or when the group stops on the trail. The best choice is a pair of full side zippered pile/fleece pants that comfortably fit over your underwear and below your wind pants. Wool pants are also acceptable, but are rather difficult to get on or off quickly since you have to remove your snowshoes/crampons/boots to get them over your feet. The “harder” the finish of the wool pants, the better. Fuzzy wool collects a lot more snow.

The comments in “General information on clothing” earlier in this handbook also apply to insulated pants.

Insulated Parka (Puffy Jacket):

A thick parka with a hood is quite valuable for evenings and mornings in camp and is required. It is also very helpful in emergency or rescue situations. Either down or synthetic fill is acceptable, as long as you realize the characteristics and limitations of each. A compression stuff sack for the parka is helpful to reduce volume in the pack.

See the “General information on clothing” earlier in this handbook.

ITEMS YOU WILL NEED WHEN ABOVE TREE LINE

Head Insulation (Balaclava):

Warm headgear is an absolute necessity. Fleece or wool balaclavas are the best. A balaclava covers your neck as well as part of your face. You can lose up to 30% of your body heat through the head and neck. Some people find wool itchy, so try it some at home since you will sleep in it as well as wear it most of the day.

Face protection:

Conditions on the summits are often extremely cold and windy, and any exposed flesh can freeze very rapidly therefore face protection in one of two forms as required. The two acceptable approaches are:

- Face mask and goggles combined with the balaclava
- “Wolf” hood

Face Mask:

The face mask must cover all skin including the throat, nose and cheeks. Knitted types are generally adequate and inexpensive. Those made of felt, leather, chamois, neoprene, or plastic are usually more windproof.

Goggles:

There are a wide variety of goggles available today that should satisfy any face and budget. Find ones that fit, completely cover the opening in the face mask and can accommodate glasses if you wear them.

Note that goggles and eyeglasses (if you wear them) do not get along well. Even if the glasses fit under the goggles, either the glasses or the goggles frequently fog up when you stop on the trail. This presents a problem without a good current solution. Also, many facemasks do not work well with eyeglasses. Contact lenses seem to be a workable alternative, but daily-wear lenses can be very troublesome if they require insertion/removal each day and cleaning solutions that must be kept liquid.

Remember: Goggles, mask, and/or balaclava must all work together easily, and you must be able to completely cover all exposed skin.

An alternative to face mask and goggles, the Wolf, Shore or Tunnel hood:



Winter climbers that wear glasses quickly learn that when using a face mask and goggle combination their glasses fog up. Many solutions have been tried with most not working well if at all. One alternative which has proven successful is the Wolf, Shore or Tunnel hood.

The tunnel portion of the hood can be made smaller or larger depending on conditions. The tunnel creates a small “microclimate” which reduces fogging of glasses.

Tunnel hoods can often be obtained at Army surplus outlets.

SLEEPING GEAR

Sleeping Bag:

One of the most important considerations for the winter mountaineer is the sleeping bag. A good night’s sleep is critical to your performance the next day.

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Your bag must be adequate for severe winter conditions. While the amount of insulation necessary for comfort in the cold is a highly subjective matter, we recommend sleeping bags rated to -20° F. Your bag should be large enough so you can sleep comfortably while wearing a layer or two of dry clothes.

Both goose down and the modern synthetic fills are acceptable for Winter School. Down is the warmest insulator per unit of weight, the most compressible, and the most expensive. It is subject to clumping when damp and total collapse when wet. The synthetics are heavier - requiring 20 to 40% more weight for an equivalent insulating value. When damp, the synthetics retain a substantial portion of their loft, thereby continuing to provide insulation.

The comments in “General information on clothing” earlier in this handbook also apply to sleeping bags.

Keeping the sleeping bag dry:

In addition to using a Vapor Barrier Liner, it is very helpful to keep the frost from your breath off the sleeping bag. Some staff members bring an extra wool sock or wool mitten. On really cold nights, when only your nose sticks out of the sleeping bag, the mitten is laid on your nose and you breathe through it. It provides a little insulation, but more important, it collects some of the moisture that otherwise gets on the sleeping bag. It has to be dried out during the day.

Another option to keep moisture off the sleeping bag is to use a “bib.” A bib is simply a large piece of fleece which is draped over the outside of the bag and tucked into the bag under your chin. The concept is that as the water vapor from your breath freezes the “snow” falls on the bib and not on the bag. In the morning you shake out the bib to get rid of the moisture. While this seems great in theory, it can be awkward in practice. Bigger pieces of fleece seem to work best. Experiment to see what works for you.

To keep you bag as dry as possible you should also avoid breathing into it during the night.

Compression Stuff Sack:

Your sleeping bag must be packed in a waterproof stuff sack. Line each sack with a plastic bag before stuffing the item.

Sleeping Pad(s):

Most sleeping bag materials compress to negligible thickness under body weight, and insufficient padding will guarantee you a cold night’s sleep. Sleeping on snow requires thick insulation. You will need at least 1” of insulation thickness under your torso, and at least 1/2” under your head, legs and feet. The first part of the solution is to bring a full-length pad of closed-cell foam of at least 1/2” thickness. The second part backs this up with another 1/2” thick pad that covers at least the distance from the top of your shoulders to the bottom of your buttocks. This will give you 1” of insulation under the major pressure points since they compress against the ground the most. The second pad can be either a closed-cell foam pad or a self-inflating open-cell foam pad. Most people prefer two full-length pads to minimize the threat

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of cold feet. On longer trips or on sled trips where a slight amount of additional weight can be accommodated some instructors bring a third ½” full length pad.

Please keep in mind that the inflatable pads go flat occasionally, especially when they get to close to an ice axe or set of crampons without point protectors. This is why one full-length pad must be closed-cell foam. You may wish to bring a patching kit for self-inflating pads.

WATER & FOOD

Water Bottles:

WIDE MOUTH, leak-proof plastic bottles are required, since it is almost impossible to pour hot water from a pot into a 1” bottleneck. Two to three quarts/liters total capacity is usually sufficient. Certain individuals may prefer more. When in doubt, carry more water until you learn what works for your body.

Hydration bladders are not acceptable, even insulated models. The tube will still freeze up when it is very cold.

Insulated Holder For Water Bottles:

Also be sure to bring one or two water bottle “parkas” (a foam insulated holder for your water bottles) to help assure your water doesn’t freeze by afternoon. An alternative solution that works most of the time is to put your water bottle in a spare wool sock intended for this purpose and put it in your pack upside down.

Accessible Water:

It is very important to have access to one of your water bottles without having to stop and remove your pack. Frequent drinking is essential in the winter and since we sometimes don’t stop very often, people tend not to drink enough. Some hikers carry one bottle next to their body to reduce the risk of freezing (either hanging around the neck on a sling or in an inner jacket pocket). Others attach their bottle parka(s) to their pack hip belt.

NOTE: Giardia is alive and well in the Adirondacks and New England. It will be necessary to treat or boil all water from the streams before drinking. Bringing water to a rolling boil is generally sufficient, and backpacking sections can expect to spend a considerable amount of time boiling water. You may, however, bring along iodine based purification tablets or other chemical treatment if you so desire. Filters freeze up instantly and become totally useless in winter. The amount suggested under the “fuel” heading has been calculated to allow for the additional boiling.

Food:

Food is discussed in a later chapter.

GEAR AND OTHER ITEMS THAT NEED TO BE IN YOUR PACK

Fuel Bottles:

Your fuel must be carried in leak proof containers. Many winter mountaineers wrap their fuel bottles with duct tape or other tape for identification (with name on it) and to keep their hands from freezing to the cold metal.

Stove Fuel (“White Gas”):

Winter Mountaineering School has chosen to standardize on liquid fueled stoves. Liquid fuel is widely available in both quarts and gallons and most all stoves suitable for winter backpacking in New York and New England camping can run on it.

How much fuel will you need?

- When water from streams is available, each participant should bring 10 ounces of fuel per night for backpacking trips.
- When the group plans on melting snow, or it is questionable that there will be running water, consult with your instructor on the amount of fuel needed per night.



On overnight trips, cooking conditions vary widely. Sometimes it is snowing. More often than not dinner (and breakfast) are cooked and eaten in the dark.



Matches/Lighters:

You will need matches or a lighter to get your stove going and for emergency situations. The most reliable solution is to bring clusters of waterproof matches distributed among several waterproof cases. Some folk also bring a disposable butane lighter. These are not as reliable,

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but if stored separately and pre-warmed in your hand, will most probably work when needed. Emergency “waterproof/windproof” matches should ALWAYS be carried in either case.

Insulated Bag for Hydrating Food:

Bring an insulated container in which to rehydrate food. The padded, square stove storage containers work well for this.

Insulated Bowl, Cup/Mug and Spoon:

Each backpacking overnight individual should bring along a spoon and insulated bowl and/or cup. A tough plastic is HIGHLY SUGGESTED since metal can freeze to your skin.

BEWARE: Certain plastics are not designed for cold weather use. Please test your prospective cup, spoon, etc., by placing it in your freezer and then immersing it in boiling water. If it cracks, it's history. It is suggested you color code or label utensils for easy identification at group camp kitchens.

“Shortie Pad”:

A small piece of closed cell foam pad should be brought along on both day trips and backpack sections. It can serve as seat during breaks and around camp, and several of them can be used together to keep an injured person off of the snow.

Headlamp:

A headlamp (with LED bulbs) is needed for unplanned (or planned) very early departures and very late returns to camp. Also, backpacking groups generally will be cooking dinner and breakfast in the dark. As a side note: flashlights prove incredibly difficult to manage while working a stove, or while performing other camp tasks. For this reason all overnight group participants are required to have a headlamp powered by a LITHIUM BATTERY. Non-Lithium batteries are acceptable provided you have a setup that allows you to keep the battery pack warm under your jacket, or you are using an LED headlamp. IN ALL CASES, BRING SPARE BATTERIES. For non-LED headlamps, also bring a spare bulb. A flashlight is an acceptable alternative for the weekend day hiking groups. As with a headlamp – bring extra batteries and make sure that it works!

Experience has shown that LED headlamps provide adequate illumination around camp and on trails that are easy to follow. However, experience has also shown that some LED headlamps generally do not provide a concentrated long distance beam and therefore become marginal when trying to find less than well maintained trails or when markers or objects at a distance need to be located.

Pocket Knife:

A simple folding blade knife is fine. Swiss army knives or the multi tool type are favorites. The scissors option is often helpful for cutting blister pads and other dressings, and the pliers can be useful for various repairs.

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Sunglasses:

Sunglasses are required and provide protection from wind and sun. For sunglasses, a hard case of some sort is nice assurance that they will not be crushed when you cram other gear into your pack.

If you cannot see without your glasses/contacts, be sure to carry a spare pair. An eyeglass strap to hold on glasses is also very useful.

See section on goggles and face masks for additional information.

Sunscreen and Lip Balm:

One small tube of sunscreen and one stick of lip balm and is sufficient.

Toiletry bag:

Include toothbrush, toothpaste, toilet paper and hand sanitizer. Toilet paper and sanitizer should be together in their own plastic bag. Do not bring soap, shampoo, deodorant, or cosmetics.

Toilet Paper and feminine hygiene products:

The “100% natural”, and environmentally preferred alternative to tissue is a snowball. It is highly effective and nowhere near as unpleasant as you might think. An added benefit is that the snow helps to keep you significantly cleaner.

If you use toilet paper and you are not at a location with an outhouse, plan to pack out or burn your used toilet paper. We don’t wish to contribute to the surprise that many spring campers discover after all the snow melts.

Women should also be prepared if there is even the faintest chance their monthly cycle may coincide with this week. Don’t forget that heavy exercise sometimes causes a period to begin sooner. All feminine hygiene products must be packed out.

Repair Kit:

You should be able to repair the equipment you carry. In past years, everything that could break, has. Repair kits frequently include: large safety pins, stiff wire, plastic zip-ties, small pliers, an awl or strong needles, coarse thread, duct tape, etc. If you are planning to attend with boots that have rubber that seals in the insulation, you must include a rubber inner tube patch kit. A patch kit is also highly recommended if you are counting on an inflatable open cell mattress. Note that when exposed to cold temperatures some plastic zip-ties break easily. Test them by putting in your freezer.

OPTIONAL GEAR

Trekking/Ski Poles:

Although not strictly required, trekking or ski poles are very highly recommended, especially for backpacking sections. The use of poles adds a great deal of stability and takes much of the load off of your knees, making them particularly valuable on long approach hikes under a heavy load. Collapsible poles are recommended because they can be stowed on your pack when not in use.

Bring poles unless you have experience snowshoeing without them while carrying the anticipated load on the terrain your section will be covering.

Summit Pack:

Your backpack can be used for climbs and day trips. External frame packs DO hang up on trees on narrow trails and during bushwhacks. A summit pack must have a **MINIMUM** 2,500 cubic inches capacity. Small teardrop shaped day packs do not have sufficient space for the proper equipment carried on winter day trips.

Please also keep in mind that each group going out on a day trip will carry several items of emergency gear that will be split up amongst the group. You may be asked to carry a means of shelter (tent, bivi sack or darksy sack), a means of providing warmth (sleeping bag and pad), a means of providing hot food and water (stove, pot, fuel and food or a vacuum bottle filled with hot liquid and food), or a first aid kit.

Your summit pack must be able to hold everything required in the “Dayhike” equipment list.

Insulated Booties:

Insulated booties are not really considered footgear, but are highly recommended by instructors as they are nice to have for wearing around camp and for use during the night for bathroom breaks. Booties with a layer of closed-cell foam in the bottom are suggested so you have insulation between your feet and the snow. You can add another layer of closed cell foam inside the bootie for additional insulation.

Vapor Barrier Sleeping Bag Liner:

A VBL is strongly recommended for all participants using down bags and optional otherwise. It is simply a large coated nylon bag with a drawstring around the opening. As an alternate to the coated nylon bag liner, the metallic emergency bivy bag also works as a VBL and is cheaper,

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easier to find, and may be lighter than a coated nylon bag liner, and is not as durable as the nylon.

The Vapor Barrier works on the principle of reducing evaporative heat loss by trapping the hot, moist air near your body. The result can be as much as a 10 to 15 degree improvement in the rating of your sleeping bag. There are varying ways to manage the sleeping in the VBL. Sleep in your synthetic long underwear or a synthetic liner sheet and keep the underwear dry for morning, as wet nylon next to the skin is not pleasant. The moisture when emerging from the VBL evaporates quickly in the dry cold air and the Sleeping bag will maintain the needed insulation dryness and loft for the next evening.

Owners of down sleeping bags will find it necessary to use their VBL's nightly to keep perspiration from entering the down and reducing its loft. The need for a VBL increases with the length of the trip, as moisture will continue to accumulate in your sleeping bag from day to day. If at a base camp, dry inside of the VBL during the day while out hiking.

Underwear/Briefs:

Sorry we have to mention it again, but **DON'T EVEN THINK OF BRINGING UNDERWEAR WITH ANY COTTON!** Synthetic briefs or 100% nylon running shorts both work well. Comfortable synthetic bras are also available.

Whisk Broom:

A small broom is helpful for sweeping up the snow that will inevitably find its way into your tent (and may then melt).

Other Items on List:

Bring them if you wish.

GROUP GEAR

The items below are not specifically required of each participant. However, if you have access to a good winter tent, stove, etc. **PLEASE** bring them. The group will get together, talk about the gear, and choose the best group equipment to be shared during School.

Tent:

Most modern dome, tunnel, or "A" frame tents designed for 3-4-season use are acceptable. The tent should have a breathable body, a waterproof fly, openings that close tightly, and the strength to withstand winter winds. Large areas of mesh in the ceiling, which is becoming more popular in many 3-season tents, is a drawback as snow may get in during a storm. Be sure to seal all seams if they are not factory sealed.

Snow Stakes:

Necessary if your tent needs stakes. Skewers or standard pegs will not hold in soft snow. An alternative is to fill any stuff sacks with snow and use them as "dead men."

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Groundsheet:

A groundsheet will protect your nylon floor from the abrasiveness of the snow and other forest products.

Snow Shovel:

A collapsible, lightweight snow shovel is very handy for constructing snow kitchens, digging snow caves, and creating emergency shelters.

Stove:

Wood fires are unacceptable for practical, as well as environmental reasons. Stoves will be used for all cooking. **THERE WILL BE NO COOKING IN TENTS** due to the carbon monoxide hazard and the fact that there is no quick way to dispose of a flaring stove.

The demands on backpacking stoves are more severe in winter than other times of the year. Stoves are used more frequently and for longer periods. Desirable characteristics include a high heat output, stability while holding a large pot, and reliability. A good winter stove will also have an integral pump.

Stoves that run on anything other than liquid fuel can be left at home.

Be sure to service your stove thoroughly prior to Winter School. Replace old gaskets and oil/replace the pump leather. Test it thoroughly. Put it in the freezer for an hour and then try to light it quickly. Each year about 20 to 30% of the stoves at School fail for one reason or another. Stove repair in the field is not fun.

Spare Stove Parts (aka stove repair kit):

A small kit of extra stove parts is important! O-rings, gaskets, cleaning tools, etc... if you bring a stove, bring a set of repair parts.

Windscreen:

A windscreen is often necessary to increase efficiency. Certain stoves may be relatively useless without one.

Not all stoves are designed to be used with windscreens. If the manufacturer of your stove does not sell or make a windscreen for that stove **DO NOT ADD A WINDSCREEN**. Some stoves are not designed to be used with windscreens and the additional heat trapped by the windscreen may cause fire or worse an explosion.

Insulated Platform:

Many stoves send sufficient heat out of the bottom of the stove to melt the snow underneath and upset the pot of whatever is on the stove. Burns resulting from a spilled pot of boiling water are a serious backcountry hazard. Participants have used snowshoes under their stoves in the past with undesirable consequences. Therefore, each person who brings a stove should also bring a piece of thin plywood, or similar heat/flame resistant product covered in non-flammable material

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to provide support for the stove. Get or make something that provides support without melting the snow underneath and tipping the pot over. Try it out at home.

Pots:

Large lightweight pots (2 quarts or larger) are very handy for melting snow and boiling large quantities of water. All pots should have a tight-fitting cover. Smaller pots are less efficient and make the cooking process more time consuming. If your pot does not have a handle, be sure to include a “pot gripper”.

Collapsible water bucket:

Very useful for carrying water from a hole in the ice or a stream back to camp. A bucket capacity of 2.0 - 2.5 gallons is sufficient.

First Aid Kit/Medications

The following table lists the basics of a sound first aid kit.

FIRST AID KIT ITEMS

Item	Quantity	Use
Alcohol swabs	5 each	Cleaning skin
Antacid	8 to 12 tablets	Indigestion/heartburn
Antibacterial Soap - hotel size	1	Cleansing abrasions
Anti-diarrhetic	6 tablets	Relief of diarrhea
Aspirin or Equivalent	10+ tablets, 5 grain	Minor pain
Adhesive bandages	10 each, 1” wide	Lacerations
Elastic Bandage	1 each, 3” wide	Support, sprains, hold dressings in place
First Aid/Rescue Info	1 each	Easy reference
Pads for blisters	2 of each, 4” x 4”	Blister prevention
Needle	1, medium	Splinters
Pencil & Paper	1 each	Notes, messages, fill out accident report
Quarters	2	Emergency phone calls
Safety Pins	3, large	Varied uses
Sanitary Napkin or 5 x 9 Gauze	1	Large bleeding wounds
Scissors	1	Cutting moleskin, tape
Metallized blankets	1	Protection, warmth
Large gauze pads	4, 4” x 4”	Larger abrasions
Triangular Bandage	1	Cravat, sling, etc.
Waterproof Adhesive Tape	1 roll, 2” wide	Securing dressings
Antiseptic Ointment	1	Abrasions, burns
Individual Medications	As needed	

IV. FOOD

Nutrition is a subject of such variety and detail that only general principles and hints will be given here. Note that different sections of Winter School may have different meal arrangements. The information below applies primarily to backpacking sections, but also gives some good advice to dayhiking sections. Most people will have to find a compromise between their everyday eating habits and those ideal for winter climbing. Keep four points in mind:

- (1) Your fluid intake must be increased dramatically to function well in the cool, dry winter air. **DEHYDRATION IS PROBABLY THE MOST COMMON CAUSE OF POOR PERFORMANCE IN THE MOUNTAINS.** A study has shown that serious dehydration can cause 20 to 30% drops in anaerobic leg and arm power. Since thirst is not an accurate indicator of when your body needs water, a routine of drinking must be established. Your daily intake should total about 4 liters. The staff will remind you (repeatedly) of this fact. Be prepared to drink on the trail and to prepare meals with more fluids (herbal tea, cocoa, soup, etc.) than you would normally have at home.

Some people add flavoring to help them drink more water. Flavoring helps reduce the impact of “flat” water produced from boiling stream water or melting snow. Pick your favorite flavors.

For those on backpacks, a “rule of thumb” is that if you are not getting up during the night to urinate, you are probably dehydrated.

- (2) Your meals must be very easy to prepare and eat; thus only those requiring rehydrating are allowed. (Delicate simmering and the subsequent scrubbing of dirty pots are not fun in the cold and dark.)
- (3) All foods must be as lightweight as possible.
- (4) You will need a lot of food, say 4,000 calories per day. Most people are accustomed to eating only around 2,000 calories. You will also need to highlight different types of food at different times so as to allow your body to function most effectively.

Four major food groupings are important to our discussion - simple carbohydrates (sugars), complex carbohydrates (grains), proteins and fats. It is important to have the correct mix of each type of food to assure that your body has something available to burn for energy.

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Your body can be likened to a fire in a wood stove. If you want to keep warm, you have to feed it fuel. Tinder/kindling (sugar) lights up easily (20 minutes), burns hot, but quickly goes out. This makes hot, sweet liquids (e.g. cocoa, hot gelatin) a good way to start a breakfast on a “brisk” morning. The tinder **MUST** be supplemented with medium-sized split wood (complex carbohydrates, some proteins). The split wood takes longer to catch, but once going, it burns steadily, with high heat output. Your remaining breakfast and daytime food should heavily emphasize complex carbohydrates since they are the best source of energy for exercising. This brings us to the big thick hardwood logs (fats). These are very tough to ignite (up to 6 hours), but once they do they will burn for a long, long time. Your hot evening meal should contain complex carbohydrates and proteins, but it is wise to also include more calories from fats since you want a long term, low-level fire to last through the night.

Needless to say, it is not in your best interest to allow the fire to go out, since it is difficult to re-light in extreme conditions. If the fire is almost out (i.e. you are tired and cold), remember that a big log will not help. You need to start with kindling and split wood to build up the heat, and then add the log.

Breakfast:

Breakfast is a much more important meal during winter mountaineering than other times. You cannot hope to eat enough in just two meals (lunch and supper) to supply your daily needs. A good breakfast will also provide the energy you need later in the day. Drink mixes, hot gelatin, herbal tea, decaffeinated coffee, etc. are important to rehydrate after the long night. Instant hot cereal of any type is a standard. It can be supplemented with honey, brown sugar, fruit (raisins, dried apricots, etc.) and powdered milk to make it more palatable. Other options include bagels, muffins, or other “high carbohydrate” baked goods like banana bread. Freeze-dried breakfast items are fine, as long as they supply substantial amounts of carbohydrate and the calories. You can consider adding things to the freeze-dried meals as well.

Caution: When frozen some foods, such as bagels, often become impossible to eat. Check in freezer at home before bringing on a trip.

Day Food:

“Lunch” begins almost as soon as you leave camp, and continues through the morning and afternoon. It must be portable, unharmed by freezing, and easily divided into numerous small installments since long stops are impossible. It must also be easily accessible while hiking and require no cooking or further preparation. The basic idea is to have your jacket pockets (or a hip belt-mounted pocket) full of breads, crackers, cookies, cheese, salami, nuts, raisins, dried apricots, candies, gorp, etc. All of these items should be pre-sliced into bite-sized pieces, since big frozen blocks are difficult to eat. Your leaders will be constantly reminding you to eat, as well as drink.

Evening Meal:

The general rule for dinners is that they must be able to be prepared without fuss. Cookgroups will not have time for each member to take 20 minutes with the stove to cook up a meal. All dinners must consist of foods that can be prepared only with the addition of boiling water.

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The most common dinners with these characteristics are freeze-dried meals. Other dinners are fine, as long as they meet the “hot water only” rules. For example, instant mashed potatoes are highly recommended by some of the staff.

If you do decide on freeze-dried dinners, check the packages carefully to BE SURE THAT NO COOKING IS REQUIRED (Many brands require extended simmering). You want the type that you pour in the water, stir, wait 5 to 10 minutes, and then munch away. Most people use an insulated container (such as the padded stove-storage containers) to keep their food hot while it rehydrates. Meals can be reconstituted in a freezer-weight zip-lock bag, or in the pouch that comes with some freeze-dried meals. Most people also bring an insulated mug to drink hot liquids out of or for instant oatmeal at breakfast. Be sure to check the quantity of food in each package. Some manufacturers are extremely optimistic when it comes to the number of hungry people their product will serve. You can also add items to those meals to make them more interesting.

Winter is lousy time to experiment with dinners. Order a variety of items and try them first. If they are palatable, then maybe they are worth carrying in. Remember everything you carry in, you have to carry out. If it tastes horrible in your dish, you have to either eat it or carry it out. It weighs a lot more rehydrated.

If you do not wish to purchase prepackaged freeze-dried meals, another option is to dry your own food or purchase freeze-dried items in bulk and make your own meals. It is best to test home dried foods for acceptable rehydration before leaving home. Check the references section of this handbook for information on dehydrating you own meals suitable for Winter School.

Extra Dinner for Emergencies

You should plan on one dinner for each night in the field plus one extra for emergencies.

Stuff Sack for Storing and Hanging Food:

Bring a stuff sack (with some cord) to put your food in to hang during the day. The bears are hibernating, but you can't imagine how innovative the pine martins and other animals are at getting your food even if it is in your tent.

Instead of hanging, a wire mesh “rodent proof” bag may be effective. However, it is still recommended to hang the “rodent proof” bag.

Other Considerations:

Before you leave home, lighten your load as much as possible by repacking your food and removing all unnecessary packaging. To avoid fumbling around on a cold dark night in camp, it may be useful to organize your food in zip lock bags. One system that works is to put smaller bags containing one dinner and the following day's breakfast and lunch into one larger zip-lock bag. That way you never need to root around in your stuff sack – simply pull out one of the larger zip-locks at dinner time – it will contain all the food you need until the following dinner. This system also helps prevent you from bringing too much in the way of snacks. It is a common

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occurrence for students to be hiking out after a four-day backpacking trip with many pounds of gorp left over in their pack.

Moving to the other end of the digestive system, former participants have sometimes experienced problems with constipation or diarrhea. Diarrhea is often caused by the remnants of a cold or flu and is usually not a major problem unless severe. Constipation is much more common, given the emphasis on high energy / light weight / low bulk foods. If you become constipated, your performance will be seriously diminished. Dried fruits, high fiber cereals, and spicy meals are helpful in remedying this situation. Hot drinks and a few prunes each day may also help.

Each person's metabolism is different, so it may take some experimentation to find the combination of foods that work best for you. Try them out on the trail before coming to Winter Mountaineering School.

When at the base camp facility (Loj) breakfast and dinner are provided. Please have all your food purchased, prepared and packaged before arriving at Winter School. There is simply not enough time to do these things at the school.

V. CONCLUSIONS

Proper clothing, food and equipment are essential for the comfort, safety, and the well being of your party. We recognize that each individual will have different requirements. One of the functions of Winter Mountaineering School is to help you learn what is safe and right for you. The required items are those that our many years of personal experience have shown form the basis for a sound and safe winter equipment inventory.

Be honest with our staff and yourself. If you are not properly prepared and your equipment is less than satisfactory, there is little chance you will enjoy your experience at Winter Mountaineering School. Learning and enjoyment are the two things we are hoping to maximize. Please don't put yourself, and your hiking/backpacking group, in a difficult situation by making shortcuts in conditioning, clothing, food or equipment.

FINALLY, DO NOT POSTPONE PACKING UNTIL THE DAY BEFORE COMING TO WINTER SCHOOL. THE BEST WAY (ONLY WAY??) TO PREPARE FOR THIS PROGRAM IS TO TAKE ALL YOUR WINTER GEAR OUT ON A HIKE PRIOR TO WINTER SCHOOL. WE CANNOT EMPHASIZE THIS POINT STRONGLY ENOUGH!!! THE ODDS OF ALL YOUR GEAR BEING IN PERFECT CONDITION, YOUR FOOD BEING PROPERLY PLANNED, AND THE WHOLE THING FITTING TOGETHER ARE INFINITELY SMALL WITHOUT A SHAKEDOWN TRIP.

We pride ourselves on having an excellent volunteer staff of knowledgeable mountaineers. Please feel free to contact us if you have ANY QUESTIONS WHATSOEVER about Winter Mountaineering School.

See you in the Mountains!

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The Winter Mountaineering School Staff



Crossing Flowed Lands heading for Mt. Colden

VI. SELECTED READING/RESOURCES

BOOKS

General Winter Skills

- **Mountaineering: The Freedom of the Hills, 8th Edition**, The Mountaineers, 2010.
A classic reference. While large parts of the book are geared towards technical rock and ice climbing, it has much to offer students of our program. The diagrams and descriptions of crampon and ice axe use are especially useful.
- **Extreme Alpinism: Climbing Light, Fast, and High**, Mark F. Twight, James Martin, and Don Graydon, 1999.
An alternate method of mountaineering – light and fast. A different take on what gear you need.
- **Allen & Mikes Really Cool Backcountry Ski Book: Traveling and Camping Skills for a Winter Environment**, Allen O'Bannon, 1996.
While geared towards the backcountry skier, this small book is mostly about winter camping. An entertaining book loaded with practical advice and tips on winter camping. The sections on snow shelters are excellent.
- **Winterwise: A Backpackers Guide, 2nd Edition**, John Dunn, 1997.
Another good all-around reference for winter travel and camping, this is put out by the Adirondack Mountain Club and written by a previous Winter Mountaineering School instructor.
- **Don't Die on the Mountain**, Dan Allen, 1998.
Another excellent general reference for winter hiking and camping written by a previous Winter Mountaineering School Instructor.
- **AMC Guide to Winter Camping, 2nd Edition**, Steve Gorman, 1999.
The Appalachian Mountain Club's guide to Winter Camping. A good all-around reference.
- **The Mountaineering Handbook**, Craig Connally, 2004.
New-school nutrition, gear, and techniques.

Map and Compass

- **The Outward Bound Map & Compass Handbook**, Glenn Randall, 1989.
An excellent and concise guide to backcountry navigation. A couple of evenings with this book are worth at least as much as many of the map and compass courses that are available.

Wilderness Navigation: Finding Your Way Using Map, Compass, Altimeter & GPS, Bob Burns and Mike Burns, 2004.

A nice compliment to the Outward Bound book.

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First Aid

- **The Outward Bound Wilderness First-Aid Handbook**, Jeffery Isaac, 1998.
Recommended by Wilderness Medical Associates – one of the companies that certifies individuals in Wilderness First Aid.

Food and Cooking

- **Backcountry Cooking: From Pack to Plate in 10 Minutes**, Dorcas Miller, 1998.
This book features meals made with home-dried and store-bought ingredients. The backcountry preparation for most of the recipes entails adding boiling water and waiting – a perfect reference for winter campers looking for an alternative to freeze-dried meals.
- **Freezer Bag Cooking: Trail Food Made Simple**, Sarah Svien Kirkconnell, 2007.
More recipes and methods that adhere to the recommended winter school meal preparation methods, without resorting to freeze-dried meals.

Winter Adventure and History – a tiny sampling of what is out there.

- **Minus 148°: First Winter Ascent of Mt. McKinley**, Art Davidson, 1999.
A gripping record of the first winter ascent of Mt. McKinley. You will read about many of the same techniques taught at Winter School and see them put to the test. A great example of leadership and perseverance under extreme conditions.
- **Desire and Ice: Searching for Perspective Atop Denali**, David Brill, 2002.
A regular guy takes a winter mountaineering course and then attempts Denali.
- **Forest and Crag, A History of Hiking, Trail Blazing, and Adventure in the Northeast Mountains**, Laura and Guy Waterman, 2003.
The definitive history of the mountains of the Northeast. Includes an early history of the Winter Mountaineering School, and defines the “Adirondack School” of climbing mountains in the winter.

ADDITIONAL EDUCATIONAL RESOURCES

- Map and Compass, Wilderness First Aid, Leave No Trace, and other outdoor skills: The Adirondack Mountain Club (www.adk.com).
- Outdoor Leadership Training: AMC Mountain Leadership School (www.outdoors.org).
- Extended Outdoor Skills and Alpine Mountaineering Training: National Outdoor Leadership School (www.nols.org).
- Organized Group Winter Hikes: Individual chapters of the Adirondack Mountain Club (www.adk.com) and Appalachian Mountain Club (www.outdoors.org).

APPENDIX A

WEEKEND DAY HIKE SECTION EQUIPMENT LIST

INDIVIDUAL GEAR

Unless otherwise noted you **MUST** have the following items (or alternates approved by the section director or instructor) for all day trips.

√	Carrying your gear on the trail – Day hikes	
	Pack: internal or external frame; minimum capacity 2500 cubic inches	Make sure your pack is sized to fit your gear.
	Rain cover for pack.	Acceptable alternative: Large, heavy duty trash bag, as an inside liner for the pack.

√	Clothing you will typically wear while hiking	
	Boots	See Winter Mountaineering School Handbook for further information
	Liner socks: 1 pair	Smooth thin socks to be worn next to the skin.
	Wool or Synthetic insulating socks: 1 pair.	To be worn over the liner socks. When layering socks, check fit over feet and inside boots.
	Vapor barrier socks (1 pair strongly recommended but not required for day trips).	Acceptable alternative: Plastic bags – at least two on each foot per day. See Winter Mountaineering School Handbook for further information.
	Tall gaiters	Ensure they fit around your boots
	Wicking base layer: Long underwear (1 top and 1 bottom)	This will be your base wicking layer and should be made of a synthetic fiber or Merino wool.
	Insulating layer: Expedition weight top for added insulation for your torso	This is an additional insulating layer made of synthetic fibers or wool for your torso.
	Rain gear (jacket and pants)	Protects against wind, wet snow, and rain.
	Hat: Fleece or wool (must cover ears)	Acceptable alternative: Balaclava
	Mittens: Wool or synthetic	Gloves are not an acceptable substitute for mittens
	Mitten shells	Wind protection for your hands
	Glove liners	Wool or synthetic anti-contact gloves

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√	Items needed for travel over snow and ice	
	Snowshoes with traction devices	Must be designed for backcountry/alpine use for secure travel on ascending steep and sustained terrain. Size (length) appropriate for your weight, including your clothing and pack
	Mechanism of attaching snowshoes to outside of pack when wearing crampons. Straps or bungee cords	Be sure snowshoes can be easily and quickly affixed to pack prior to coming to WMS
	Full (10 or 12 point) crampons	Aluminum not acceptable for hard east coast mountain ice.
	Mechanism to cover points of crampons when they are not being used. A crampon bag is best.	
	Mechanism to attach crampons to outside of pack. Straps or bungee cords	Option: You can carry crampons inside pack
	General mountaineering ice axe (approximately 65- 80 cm for most people)	
	Ice axe protectors (pick, adz, spike)	

√	Items that need to be accessible on your person while hiking	
	Paper and pencil	Small pocket sized “Rite-in-Rain” notebook and pencil.
	Map of area (in plastic bag)	
	Compass: Flat, baseplate type with rotating housing	Best: Compass with adjustable declination mechanism
	Plastic whistle and strap to tie around neck	

√	Clothing that needs to be in your pack – “extra clothing”	
	Liner socks: 1 pair	This is a spare pair. Smooth thin socks to be worn next to the skin.
	Wool or Synthetic insulating socks: 1 pair.	This is a spare pair. To be worn over the liner socks. When layering socks, check fit over feet and inside boots.
	Wicking base layer -2 nd pair long underwear (1 top and 1 bottom)	This will be your second pair of base wicking layer and should be made of synthetic fiber or Merino wool for emergency use. Most wear the first pair the entire trip.

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	Insulating jacket: Fleece, wool, or synthetic jacket(s)	This layer of clothing should be of moderate thickness, reasonable warmth and should be simple to put on and take off.
	Insulating pants: Fleece, wool or synthetic-fill pants with full side zippers	Acceptable alternative: Any insulating pants that can be put on without removing your boots
	Down or synthetic parka with hood (puffy coat)	Parka needs to fit over all clothing layers. A stuff sack for the parka can be used to reduce volume in pack.
	Glove liners	This is a spare pair
	Mittens: Wool or synthetic	This is a spare pair

√	Items you will need when going above tree line	
	Head insulation covering head, ears, face and neck: Balaclava	
	Face and neck protection – windproof – typically leather or neoprene face mask.	Acceptable alternative: Cold weather shore hood (Wolf hood).
	Eye Protection - Ski goggles	Acceptable alternative: Cold weather shore hood (Wolf hood). Note: Glacier glasses or sun glasses are not an acceptable alternative.

√	Water & food - Note: you are responsible for your own trail food.	
	Water: 2-3 wide-mouth 1 quart water bottles.	Water bag/bladder systems are not acceptable. They freeze and/or are hard to fill.
	Insulated holders for water bottles	Acceptable alternative: Putting water bottles in your extra socks and wrapping water bottles in your extra clothing
	Accessible water: Method of attaching one of the insulated water bottle holders to the exterior of the pack so it is accessible without removing pack	Acceptable alternatives: Bota (wine bag), hang a bottle from neck and inside insulating layers, carry a bottle in an inside pocket.

√	Gear and other items that need to be in your pack	
	50' thin nylon cord (used for emergency repair)	

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	Closed-cell foam or self-inflating “shortie” pad to sit on and for emergency use (approximately 20” x 12)	Note: Some packs have a removable pad.
	Headlamp (LED) with fresh batteries & backup batteries	
	Matches/lighters in waterproof cases	
	Pocket knife	
	Sunglasses	
	Female hygiene items (as appropriate)	
	Toilet paper (in plastic bag), hand sanitizer	
	Sunscreen	
	Lip balm	
	Glasses – extra (if you wear glasses) in crush proof case	

√	Other optional items – consider the weight/bulk vs. value or utility before buying or carrying	
	Trekking Poles	Helpful for balance when carrying a pack or for knee problems.
	Head band or buff	Keeps ears warm when a hat is not needed and can be a face / neck cover when in wind
	Traction aids, instep crampons, creepers or any of the various traction devices that are not full boot crampons	Traction aids are beneficial for getting around the Loj area during icy conditions, as well as some portions of our hikes where there is relatively level terrain with very hard packed snow and ice.
	Vacuum bottle (Thermos)	½ to 1 liter size.
	Head band and/or buff	Keeps ears warm when a hat is not needed
	Photocopy or notes	Such as distances, times, trail junctions, etc. from the relevant guidebook(s).
	Camera (small)	A large SLR camera is not recommended.

GROUP GEAR

Each day hike group will be required to split up and carry the following emergency items. Please bring any of these if you have them.

	Sleeping bag rated to –20° F in waterproof compression stuff sack and plastic garbage bag
	Stove with fuel pump and wind screen
	Fuel bottle filled with fuel “white gas”
	Covered 1-3 liter pot for melting snow/ice and boiling water
	Emergency shelter (e.g. Zdarsky bag, tent without poles, large bivy bag, etc.)
	Group first aid kit
	Full length foam pad (not an inflatable pad)
	Repair kit (wire, tape, nylon cord, pliers, etc...)

APPENDIX B

**WEEKEND BACKPACKING SECTION EQUIPMENT LIST
INDIVIDUAL GEAR**

Unless otherwise noted you **MUST** have the following items (or alternates approved by the section director or instructor).

√	Backpack for carrying your gear	
	Pack: internal or external frame. Typically this is a minimum of 5500 cubic inches	Make sure your pack is sized to fit your gear.
	Rain cover for pack.	Acceptable alternative: Large, heavy duty trash bag, as an inside liner for the pack.

√	Clothing you will typically wear while hiking	
	Boots	See Winter Mountaineering School Handbook for further information.
	Liner socks: 1 pair	Smooth thin socks to be worn next to the skin.
	Wool or Synthetic insulating socks: 1 pair.	To be worn over the liner socks. When layering socks, check fit over feet and inside boots.
	Vapor barrier socks	Acceptable alternative: Plastic bags – at least two on each foot per day. See Winter Mountaineering School Handbook for further information.
	Tall gaiters	Ensure they fit around your boots
	Wicking base layer: Long underwear (1 top and 1 bottom)	This will be your base wicking layer and should be made of a synthetic fiber or Merino wool.
	Insulating layer: Expedition weight top for added insulation for your torso	This is an additional insulating layer made of synthetic fibers or wool for your torso.
	Rain gear (jacket and pants)	Protects against wind, wet snow and rain.
	Hat: Fleece or wool (must cover ears)	Acceptable alternative: Balaclava
	Mittens: Wool or synthetic	Gloves are not an acceptable substitute for mittens
	Mitten shells	Wind protection for your hands
	Glove liners	Anti-contact gloves

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√	Items needed for travel over snow and ice	
	Snowshoes with traction devices	Must be designed for backcountry/alpine use for secure travel on ascending steep and sustained terrain. Size (length) appropriate for your weight, including your clothing and pack
	Mechanism of attaching snowshoes to outside of pack when wearing crampons. Straps or bungee cords	Be sure snowshoes can be easily and quickly affixed to pack prior to coming to WMS
	Full (10 or 12 point) crampons	Aluminum not acceptable for hard east coast mountain ice.
	Mechanism to cover points of crampons when they are not being used. A crampon bag is best.	
	Mechanism to attach crampons to outside of pack. Straps or bungee cords	Option: You can carry crampons inside pack
	General mountaineering ice axe (approximately 65- 80 cm for most people)	
	Ice axe protectors (pick, adz, spike)	

√	Items that need to be accessible on your person while hiking	
	Paper and pencil	Small pocket sized “Rite-in-Rain” notebook and pencil.
	Map of area (in plastic bag)	
	Compass: Flat, baseplate type with rotating housing	Best: Compass with adjustable declination mechanism
	Plastic whistle and strap to tie around neck	

√	Clothing that needs to be in your pack – “extra clothing”	
	Liner socks: 1 to 2 pair	This is a spare pair(s). Smooth thin socks to be worn next to the skin.
	Wool or Synthetic insulating socks: 1 to 2 pair.	This is a spare pair(s). To be worn over the liner socks. When layering socks, check fit over feet and inside boots.
	Wicking base layer -2 nd pair long underwear (1 top and 1 bottom	This will be your second pair of base wicking layer and should be made of synthetic fiber or Merino wool for emergency use. Most wear the first pair the entire trip.

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	Insulating jacket: Fleece, wool, or synthetic jacket(s)	This layer of clothing should be of moderate thickness, reasonable warmth and should be simple to put on and take off.
	Insulating pants: Fleece, wool or synthetic-fill pants with full side zippers	Acceptable alternative: Any insulating pants that can be put on without removing your boots.
	Down or synthetic parka with hood (puffy coat)	Parka needs to fit over all clothing layers. A stuff sack for the parka can be used to reduce volume in pack.
	Glove liners	This is a spare pair
	Mittens: Wool or synthetic	This is a spare pair

√	Items you will need when going above tree line	
	Head insulation covering head, ears, face and neck: Balaclava	
	Face and neck protection – windproof – typically leather or neoprene face mask.	Acceptable alternative: Cold weather shore hood (Wolf hood).
	Eye Protection - Ski goggles	Acceptable alternative: Cold weather shore hood (Wolf hood). Note: Glacier glasses or sun glasses are not an acceptable alternative.

√	Sleeping gear	
	Sleeping Bag: rated to at least to –20° F (20 degrees Fahrenheit below zero)	
	Waterproof compression stuff sack and heavy duty garbage bag for sleeping bag	Compression sack necessary to reduce volume when packing. Sleeping bag compressed inside stuff sack inside garbage bag to protect against moisture.
	Sleeping pads (2): at least 1 inch under torso (one can be a self-inflating pad, but not both, and one must be full body length)	Optional: Two closed cell pads.

√	Water & food	
	Water: 2-3 wide-mouth 1 quart water bottles.	Water bag/bladder systems are not acceptable. They freeze and/or are hard to fill.
	Insulated holders for water bottles	Acceptable alternative: Putting water bottles in your extra socks and wrapping water bottles in your

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		extra clothing
	Accessible water: Method of attaching one of the insulated water bottle holders to the exterior of the pack so it is accessible without removing pack	Acceptable alternatives: Bota (wine bag), hang a bottle from neck and inside insulating layers, carry a bottle in an inside pocket
	Food appropriate for duration of trip (breakfast, snacks, lunch and dinner)	See Winter Mountaineering School Handbook for further information.
	Extra dinner for emergencies (freeze dried recommended due to weight and volume)	
	Stuff sack for storing and hanging food	

√	Gear and other items that need to be in your pack	
	Fuel bottle(s)	Please tape or mark fuel bottle(s) to identify they are yours.
	Fuel: “white gas”	10 ounces per person per night
	Matches/lighters in waterproof cases	
	Mechanism to keep food hot while rehydrating and eating	Insulated bag or other container
	Cup/Mug (insulated)	Insulated mug for hot drinks. Mug with snap on lid is preferable (retains heat well and is spill-resistant).
	Spoon (plastic).	Tough plastic (Lexan). No metal. You do not need a fork and knife.
	50’ thin nylon cord	Used for emergency repair
	Closed-cell foam or self-inflating “shortie” pad to sit on and for emergency use (approximately 20” x 12”)	Note: Some packs have a removable pad.
	Headlamp (LED) with fresh batteries & backup batteries	
	Pocket knife	
	Sunglasses	
	Female hygiene items (as appropriate)	
	Sunscreen	
	Lip balm	
	Toilet articles sufficient for trip: Toothbrush, toothpaste, toilet paper (in plastic bag), hand sanitizer	Do not include soap, shampoo, deodorant, or cosmetics. Toilet paper and sanitizer should be together in their own plastic bag.
	Glasses – extra (if you wear glasses) in crush proof case	

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OPTIONAL GEAR	
√	The following individual items are NOT required, but may be highly desirable, depending on the trip and your perspective. This list is by no means exhaustive. Consider the weight/bulk vs. value or utility before buying or carrying
	Trekking or ski poles (recommended). Helpful for balance when carrying a pack or for knee problems.
	Traction aids, instep crampons, creepers or any of the various traction devices that are not full boot crampons - Traction aids are beneficial for getting around the Loj area during icy conditions, as well as some portions of our hikes where there is relatively level terrain with very hard packed snow and ice.
	Summit pack – pack sufficient to carry day hiking gear
	Insulated booties. Camp booties can be worn alone or in conjunction with your boot's plastic shell.
	Vapor barrier sleeping bag liner (recommended for down bags)
	Head band or buff - keeps ears warm when a hat is not needed and can be a face / neck cover when in wind or sleeping bag.
	Underwear/briefs/bra (most folks wear the same clothes for the duration)
	Other clothing items
	Earplugs
	Extra plastic bags (various sizes)
	Vacuum bottle (thermos)
	Tiny whisk broom (sweep the snow out of the tent)
	Water purifying tablets
	Candle lantern
	Altimeter watch / GPS / Smart Phone
	Photocopy or notes (such as distances, times, trail junctions, etc.) from the relevant guidebook(s)
	Camera (small) - A large SLR camera is not recommended.

GROUP GEAR

These items are NOT required, but please bring them if you have them. If past experience is correct, there will be enough to share. Your Instructor will contact you to coordinate shared gear to make sure there are no shortages during Winter Mountaineering School.

	Tent: 2-3 person. 3 or 4-season tent (the less mesh in the ceiling the better)
	Snow stakes, deadmen or other mechanism to anchor tent
	Groundsheet for tent – aka “footprint” (optional)
	Snow shovel (lightweight)

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	Light rope to hang food
	Stove: Liquid fuel. Make sure fuel pump and wind screen is included.
	Stove repair kit
	Platform for stove – thin plywood covered in non-flammable material
	Pot – at least two quarts, with lid and handle (or bring pot gripper)
	Small dipping cup for getting boiling water from pots (1 cup size)
	Collapsible water bucket
	Bag for trash/garbage
	Tarp, including sufficient nylon cords. Protects cooking area from rain and blowing snow.
	Emergency shelter (e.g. Zdarsky bag, tent without poles, large bivy bag, etc.)
	Group first aid kit
	Repair kit (wire, tape, nylon cord, pliers, etc...)

APPENDIX C

COMBINATION SECTION EQUIPMENT LIST

INDIVIDUAL GEAR

Unless otherwise noted you **MUST** have the following items (or alternates approved by the section director or instructor).

√	Backpack for carrying your gear	
	Pack: internal or external frame. Typically this is a minimum of 5500 cubic inches	Make sure your pack is sized to fit your gear.
	Rain cover for pack.	Acceptable alternative: Large, heavy duty trash bag, as an inside liner for the pack.

√	Clothing you will typically wear while hiking	
	Boots	See Winter Mountaineering School Handbook for further information
	Liner socks: 1 pair	Smooth thin socks to be worn next to the skin.
	Wool or Synthetic insulating socks: 1 pair	To be worn over the liner socks. When layering socks, check fit over feet and inside boots.
	Vapor barrier socks	Acceptable alternative: Plastic bags – at least two on each foot per day. See Winter Mountaineering School Handbook for further information.
	Tall gaiters	Ensure they fit around your boots
	Wicking base layer: Long underwear (1 top and 1 bottom)	This will be your base wicking layer and should be made of a synthetic fiber or Merino wool.
	Insulating layer: Expedition weight top for added insulation for your torso	This is an additional insulating layer made of synthetic fibers or wool for your torso.
	Rain gear (jacket and pants)	Protects against wind, wet snow and rain.
	Hat: Fleece or wool (must cover ears)	Acceptable alternative: Balaclava
	Mittens: Wool or synthetic	Gloves are not an acceptable substitute for mittens
	Mitten shells	Wind protection for your hands

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	Glove liners	Anti-contact gloves
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√	Items needed for travel over snow and ice	
	Snowshoes with traction devices	Must be designed for backcountry/alpine use for secure travel on ascending steep and sustained terrain. Size (length) appropriate for your weight, including your clothing and pack
	Mechanism of attaching snowshoes to outside of pack when wearing crampons. Straps or bungee cords	Be sure snowshoes can be easily and quickly affixed to pack prior to coming to WMS
	Full (10 or 12 point) crampons	Aluminum not acceptable for hard east coast mountain ice.
	Mechanism to cover points of crampons when they are not being used. A crampon bag is best.	
	Mechanism to attach crampons to outside of pack. Straps or bungee cords	Option: You can carry crampons inside pack
	General mountaineering ice axe (approximately 65- 80 cm for most people)	
	Ice axe protectors (pick, adz, spike)	

√	Items that need to be accessible on your person while hiking	
	Paper and pencil	Small pocket sized “Rite-in-Rain” notebook and pencil.
	Map of area (in plastic bag)	
	Compass: Flat, baseplate type with rotating housing	Best: Compass with adjustable declination mechanism
	Plastic whistle and strap to tie around neck	

√	Clothing that needs to be in your pack – “extra clothing”	
	Liner socks: 1 to 2 pair. (Bring additional pairs for weekend portion of course)	This is a spare pair(s). Smooth thin socks to be worn next to the skin.
	Wool or Synthetic insulating socks: 1 to 2 pair. (Bring additional pairs for weekend portion of course)	This is a spare pair(s). To be worn over the liner socks. When layering socks, check fit over feet and inside boots.
	Wicking base layer -2 nd pair long underwear (1 top and 1 bottom)	This will be your second pair of base wicking layer and should be

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		made of synthetic fiber or Merino wool for emergency use. Most wear the first pair the entire trip.
	Insulating jacket: Fleece, wool, or synthetic jacket(s)	This layer of clothing should be of moderate thickness, reasonable warmth and should be simple to put on and take off.
	Insulating pants: Fleece, wool or synthetic-fill pants with full side zippers	Acceptable alternative: Any insulating pants that can be put on without removing your boots
	Down or synthetic parka with hood (puffy coat)	Parka needs to fit over all clothing layers. A stuff sack for the parka can be used to reduce volume in pack.
	Glove liners	This is a spare pair
	Mittens: Wool or synthetic	This is a spare pair

√	Items you will need when going above tree line	
	Head insulation covering head, ears, face and neck: Balaclava	
	Face and neck protection – windproof – typically leather or neoprene face mask.	Acceptable alternative: Cold weather shore hood (Wolf hood).
	Eye Protection - Ski goggles	Acceptable alternative: Cold weather shore hood (Wolf hood). Note: Glacier glasses or sun glasses are not an acceptable alternative.

√	Sleeping gear	
	Sleeping Bag: rated to at least to –20° F (20 degrees Fahrenheit below zero)	
	Waterproof compression stuff sack and heavy duty garbage bag for sleeping bag	Compression sack necessary to reduce volume when packing. Sleeping bag compressed inside stuff sack inside garbage bag to protect against moisture.
	Sleeping pads (2): at least 1 inch under torso (one can be a self-inflating pad, but not both, and one must be full body length)	Optional: Two closed cell pads.

√	Water & food	
	Water: 2-3 wide-mouth 1 quart water bottles.	Water bag/bladder systems are not

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		acceptable. They freeze and/or are hard to fill.
	Insulated holders for water bottles	Acceptable alternative: Putting water bottles in your extra socks and wrapping water bottles in your extra clothing
	Accessible water: Method of attaching one of the insulated water bottle holders to the exterior of the pack so it is accessible without removing pack	Acceptable alternatives: Bota (wine bag), hang a bottle from neck and inside insulating layers, carry a bottle in an inside pocket
	Food appropriate for duration of trip (breakfast, snacks, lunch and dinner)	See Winter Mountaineering School Handbook for further information.
	Extra dinner for emergencies (freeze dried recommended due to weight and volume)	
	Stuff sack for storing and hanging food	

√	Gear and other items that need to be in your pack	
	Fuel bottle(s)	Please tape or mark fuel bottle(s) to identify they are yours.
	Fuel: “white gas”	10 ounces per person per night
	Matches/lighters in waterproof cases	
	Mechanism to keep food hot while rehydrating and eating	Insulated bag or other container
	Cup/Mug (insulated)	Insulated mug for hot drinks. Mug with snap on lid is preferable (retains heat well and is spill-resistant.
	Spoon (plastic).	Tough plastic (lexan). No metal. You do not need a fork and knife.
	50’ thin nylon cord (used for emergency repair)	
	Closed-cell foam or self-inflating “shortie” pad to sit on and for emergency use (approximately 20” x 12”)	Note: Some packs have a removable pad.
	Headlamp (LED) with fresh batteries & backup batteries	
	Pocket knife	
	Sunglasses	
	Female hygiene items (as appropriate)	
	Sunscreen	
	Lip balm	
	Toilet articles sufficient for trip: Toothbrush, toothpaste, toilet paper (in plastic bag), hand	Do not include soap, shampoo, deodorant, or cosmetics. Toilet

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sanitizer	paper and sanitizer should be together in their own plastic bag.
Glasses – extra (if you wear glasses) in crush proof case	

√	OPTIONAL GEAR
	The following individual items are NOT required, but may be highly desirable, depending on the trip and your perspective. This list is by no means exhaustive. Consider the weight/bulk vs. value or utility before buying or carrying
	Trekking or ski poles (recommended). Helpful for balance when carrying a pack or for knee problems.
	Traction aids, instep crampons, creepers or any of the various traction devices that are not full boot crampons - Traction aids are beneficial for getting around the Loj area during icy conditions, as well as some portions of our hikes where there is relatively level terrain with very hard packed snow and ice.
	Day/summit pack – pack sufficient to carry day hiking gear (combo section students may want this for the day hike portion of the program)
	Insulated booties. Camp booties can be worn alone or in conjunction with your boot's plastic shell.
	Vapor barrier sleeping bag liner (recommended for down bags)
	Underwear/briefs/bra (most folks wear the same clothes for the duration)
	Headband or Buff - keeps ears warm when a hat is not needed and can be a face / neck cover when in wind or sleeping bag.
	Other clothing items
	Earplugs
	Extra plastic bags (various sizes)
	Vacuum bottle (thermos)
	Tiny whisk broom (sweep the snow out of the tent)
	Water purifying tablets
	Candle lantern
	Altimeter watch / GPS / Smart Phone
	Photocopy or notes (such as distances, times, trail junctions, etc.) from the relevant guidebook(s)
	Camera (small) - A large SLR camera is not recommended.

GROUP GEAR

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These items are NOT required, but please bring them if you have them. If past experience is correct, there will be enough to share. Your Instructor will contact you to coordinate shared gear to make sure there are no shortages during winter mountaineering school.

	Tent: 2-3 person. 3 or 4-season tent (the less mesh in the ceiling the better)
	Snow stakes, deadmen or other mechanism to anchor tent
	Groundsheet for tent – aka “footprint” (optional)
	Snow shovel (lightweight)
	Light rope to hang food
	Stove: Liquid fuel. Make sure fuel pump and wind screen is included.
	Stove repair kit
	Platform for stove – thin plywood, covered in non-flammable material.
	Pot – at least two quarts, with lid and handle (or bring pot gripper)
	Small dipping cup for getting boiling water from pots (1 cup size)
	Collapsible water bucket
	Bag for trash/garbage
	Tarp, to include cords. Protects cooking area from rain
	Emergency shelter (e.g. Zdarsky bag, tent without poles, large bivy bag, etc.)
	Group first aid kit
	Repair kit (wire, tape, nylon cord, pliers, etc...)

Student Handbook – ADK Winter Mountaineering School **Appendix D - Change History**

Version	Date	Changed by	Description
01	12/02/2012	Leonard Pratt, John Young, Jim Daley	Version before this change list was created
02	01/28/2013	Karen Rosencrans, John Young, Howie Dow	<p>Non-Technical</p> <ul style="list-style-type: none"> Revised title page to state more clearly what this document is and the focus of the information contained in it Changed organization of handbook Moved copyright statement to footer and added © symbol Added photos <p>Technical</p> <ul style="list-style-type: none"> Strengthened the statement about physical conditioning Added table showing cubic inches and liters for packs Added caution about bungee cords Elaborated the discussion about vapor barriers for socks and sleeping bags Added information about alternative lacing schemes for plastic boots Added information on holding up vapor barrier socks Elaborated information on drying gear Clarified requirements for a “puffy coat” Added information on pile and wool mittens and about “idiot” cords for keeping mittens on your person Added section on foot traction devices (other than crampons) Added section on ice axe leashes Added information on maps and sources Clarified information on compasses Updated section on goggles, face masks and “wolf” hoods Added section on keeping exterior of sleeping bag dry Added information in section about headlamps
03	12/24/2013	H. Dow	<ul style="list-style-type: none"> Corrected typographic errors
04	04/15/2016	Karen Rosencrans, John Young, Phil Zurek	<ul style="list-style-type: none"> Moved extra pair of long underwear to what you carry section and added to day hike listing, updated description in detailed overview. Added” headband and/or buff” in optional clothing to all lists
05	11/21/2016	Jim Daley	<p>Changed the caption from “Mt. Whiteface” to Whiteface Mountain on page Also,changed the program info and tech info email links throughout document. The links were no longer correct due to a change in web management from our old website. Added revision history and corrected version number in footer. Entire document page breaks were readjusted.</p>



WMS group on Mt. Colden